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DOCUMENT MODIFICATION REQUEST (DMR)

MAW 12/16/94

Refer to 1-A01-PPG-001 for Processing Instructions.
Print or **Type** All Information (Except Signatures)

1. Date	25.
December 15, 1994	DMR. No. 94-DMR- ERM-0148 (line 12/20/94)

[redacted]isting Document Number/Revision [redacted]00-WP-OU 05.1/Rev 7	3. New Document Number or Document Number if it is to be changed with this Revision N/A
4. Originator's Name/Phone/Page/Location Mark R. Wood/8784/5904/080-641	5. Document Title: FINAL PHASE I RFI/RI WORK PLAN FOR OPERABLE UNIT 5 WOMAN CREEK PRIORITY DRAINAGE, Volume III - Text to Technical Memorandum No. 15 - Amended Field Sampling Plan

6. Document Type ☐ Procedure
X Other Work Plan

7. Document Modification Type (Check only one)
☐ New ☐ Revision ☐ Intent Change x Nonintent Change ☐ Editorial Correction ☐ Cancellation

8. Item	9. Page	10. Step	11. Proposed Modifications
1	3-6	3.1.2.2	Third paragraph, second sentence, add "or eight-inch" after, Six-inch.
2	3-7	3.1.2.2	First paragraph, after the last sentence, add the following sentence. One of the cased geotechnical borings will be used as a unweathered bedrock monitoring well, see Section 3.1.2.3.
3	3-10	3.1.2.3	First paragraph, first bullet item, insert "up to" before 9 piezometers.
4	3-11	3.1.2.3	Insert the following paragraph after second paragraph. One of the geotechnical boreholes and piezometers will be converted to a deep bedrock monitoring well with the same purpose as stated above. The location to be converted is east of the former ponds and south of the borehole cluster 58393, 58493, and 58593 (Figure 3.1.2.2-1). If UHSU groundwater is encountered, one of the geotechnical boreholes/piezometers located to the west, will be moved to be adjacent to the deep bedrock monitoring well.
5	3-11	3.1.2.3	Third paragraph, second sentence, add "or eight-inch" after, A 6-inch.

12. Justification (Reason for Modification, EJO#, TP#, etc.)

[redacted]ess EPA concerns regarding hydraulic interaction between Upper Hydrostratigraphic Unit groundwater and Lower Hydrostratigraphic Unit groundwater in the area of the former ponds, [redacted]central portion of IHSS 115 in OU5, Technical Memorandum No. 15. The DOE-RFFO counterpart, Kurt Muenchow, verbally concurs with the scope of this Document Modification Request.

If modification is for a new procedure or a revision, list concurring disciplines in Block 13, and enter N/A in Blocks 14 and 15. If modification is for any type of change or a cancellation, organizations are listed in Block 13, then Concurror prints, and signs in Block 14, and dates in Block 15.

13. Organization	14. Print and Sign (if applicable)	15. Date (if applicable)
EQS	E LUKER	12-19-94
OU5 FS Team		12-16-94
OU5 PM		

16. Originator's Supervisor (print/sign/date) Ed Mast/ for EC Mast

17. Assigned SME/Phone/Page/Location	18. Cost Center 3120	19. Charge Number 98647900	20. Requested Completion Date	21. Effective Date
Mark R. Wood/8784/5904/080-641 MRW			December 22, 1994	12/20/94 (line)

22. Accelerated Review?	23. ORC Review: Not Required
[redacted]es ☐ No x	

[redacted]esponsible Manager (print, sign, date)
Ed Mast/ for EC Mast

REVIEWED FOR CLASSIFICATION/UCNI
BY NA
DATE NA

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The second task consists of reviewing topographic maps prior to the slump. If a topographic map of an appropriate scale and contour interval (2-foot) cannot be located, large scale stereo pair aerial photographs may be used to estimate pre-slump topography.

For the third task, the subsurface geometry shall be obtained from boreholes. Locations of existing boreholes do not provide adequate areal distribution to characterize the subsurface geometry. Therefore, based on the overall visible width of the existing failures and the accessibility, nineteen boreholes will be located in IHSS 115 as shown in Figure 3.1.2.2-1. Soil samples will be collected in accordance with SOP GT.2, Drilling and Sampling Using Hollow-Stem Auger Techniques until weathered bedrock is encountered: at which time the sampler will be switched from a drive sampler over to a Shelby tube-type sampler. The borings will be advanced 2-ft. into unweathered bedrock; at which time, the site geologist will determine whether to case the hole in accordance with SOP GT.3, Isolating Bedrock from Alluvium with Grouted Surface Casing, or abandon the hole in accordance with SOP GT.5, Plugging and Abandonment of Boreholes. Boreholes and soil samples will be logged in accordance with SOP GT.1, Logging Alluvial and Bedrock Material. All locations will be surveyed in accordance with SOP GT.17, Land Surveying (0.1 foot accuracy).

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Five of the nineteen geotechnical boreholes, to be located in the principal landslide failure areas, may require surface casing in order to advance the boring for the following three reasons: one, to confirm the presence of unweathered bedrock; two, to prevent the potential for cross contamination between the Upper Hydrostratigraphic Unit (UHSU) and the Lower Hydrostratigraphic Unit (LHSU); and three, to confirm that there are no more landslide rupture planes at depth. Six-inch or eight-inch nominal diameter, schedule 80, PVC casing will be installed as the surface casing. Information obtained from the boreholes will provide input for both the stability analysis and the groundwater modeling. Depth-to-bedrock data will be used

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to revise the bedrock topography in OU5. One of the cased geotechnical borings will be used as an unweathered bedrock monitoring well, see Section 3.1.2.3.

To facilitate the access of the hollow-stem auger drill rig to the geotechnical borings located in the central landslide area, the subcontractor will coordinate with EG&G Construction Management, Heavy Equipment and Labor, Trucking, and Ecology and Watershed Management for the purpose of constructing a temporary fill road. The temporary fill road will be located as shown on Figure 3.1.2.2-1. The temporary fill road will be placed without excavating or disturbing the existing hillside to allow level access for the drill rig to the boring location. Heavy Equipment and Labor and Trucking will provide the necessary heavy equipment consisting of, but not limited to, a front-end loader, dump truck, and bulldozer. Clean fill material will be provided by Heavy Equipment and Labor and compacted in place with the bulldozer or front-end loader. Ecology and Watershed Management will clear the access route and provide direction regarding reseeding and revegetating the fill material at completion of the task. Access to the temporary fill road will be blocked by trenching at the east end of each fill material placement area upon completion of the task.

Core samples will be retained in core boxes and logged in accordance with SOP GT.1. Logging Alluvial and Bedrock Material. Core samples will not be submitted for environmental chemical analysis. However, if field screening indicates the potential for contaminants, environmental samples will collected for analysis for OU5 target analytes (Table 3.1.2-1). Soil cuttings generated from within IHSS 115 will be composite sampled, one per four drums, and managed in accordance with the following SOPs: FO.8, Handling of Drilling Fluids and Cuttings; FO.10, Receiving, Labeling, and Handling Environmental Material Containers; FO.23, Management of Soil and Sediment Investigative Derived Materials (IDM); and FO.29, Disposition of Soil and Sediment Investigation Derived Materials. Boreholes located outside of IHSS 115 and adjacent

3.1.2.3 Groundwater Investigation

In order to more completely evaluate the presence and quality of groundwater at and downgradient of the Original Landfill, additional groundwater samples need to be collected and analyzed. Since the presence and quantity of groundwater appears to be limited, this task shall consist of three work elements:

1) install and develop up to 9 piezometers, 5 mini-wells, and three deep bedrock (LHSU) monitoring wells (Figure 3.1.2.2-1);

2) measure water levels in all well points, mini-wells, piezometers, and monitoring wells that are along or north of Woman Creek, south of the south Buffer-Zone access road, east of the western edge of IHSS 115 (approximately CPT07393), and west of the eastern edge of IHSS 115 (approximately CPT05393) on a monthly basis for one year; and

3) obtain samples from any location that is downgradient of the landfill if water level measurements indicate presence of a sufficient quantity of water.

The purpose of installing the nine piezometers and five mini-wells is to further characterize the present or absence of groundwater. The nine piezometers to be installed will be constructed in the geotechnical boreholes (see Secion 3.1.2.2) where groundwater is encountered. The five proposed mini-well locations are placed in 1) bedrock lows that were identified during the CPT investigation (but water was not detected), and 2) between existing well points. Of the five mini-wells to be installed, four shall be installed downgradient of IHSS 115 and one shall be installed on the upper level part of the eastern end of IHSS 115 in the vicinity of borehole 50792. This latter location will be used for only water level input for the hydrogeologic model and not sampling. These mini-wells will be installed using a small all-terrain vehicle rig which does not produce soil cuttings. Composite soil samples will be collected during drilling in accordance with the procedures outlined in TM7 (EG&G, 1993e). In addition, discrete samples

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will be collected at 2-foot intervals for VOC analyses. Analytical parameters for soil samples will be the same as specified in the OU5 Work Plan (see Table 3.1.2-1).

Three bedrock monitoring wells will be installed to evaluate the potential for hydraulic interaction between the groundwater from the Upper Hydrostratigraphic Unit (UHSU), consisting of alluvial and weathered bedrock materials, and the Lower Hydrostratigraphic Unit (LHSU), unweathered bedrock materials. The bedrock monitoring wells will be installed in an attempt to identify possible sandstone units, fracture zones, or other potential water bearing intervals in the LHSU. Figure 3.1.2.2-1 shows the location of the three bedrock monitoring well locations around IHSS 115 (the old landfill). There will be three wells installed, one upgradient and two downgradient. In addition, the bedrock wells are located near UHSU wells or mini-wells for evaluation of vertical hydraulic gradients. One of the geotechnical borings will be converted to a deep bedrock monitoring well with the same purpose as stated above. The location to be converted is east of the former ponds and south of the borehole cluster 58393, 58493, and 58593 (Figure 3.1.2.2-1). If UHSU groundwater is encountered, one of the geotechnical boreholes/piezometers located to the west, will be moved to be adjacent to the deep bedrock monitoring well.

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Borings will be drilled in accordance with SOPS GT.2, Drilling and Sampling Using Hollow-Auger Drilling Techniques and GT.4, Rotary Drilling and Rock Coring. A 6-inch or eight-inch nominal diameter, schedule 80 PVC, surface casing will be grouted a minimum of 3 feet into unweathered bedrock in accordance with SOP GT.3, Isolating Bedrock from Alluvium with Grouted Surface Casing. Based on existing boring log information, this depth will be approximately 20 to 40 feet below ground surface. The borings will be advanced to an approximate depth of 150 feet of 15 feet past a potential water bearing interval, if the water bearing interval is encountered at a depth less than 150 feet. The borings will be geophysically

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logged, in accordance with SOP GT.15 Geophysical Borehole Logging using the following open hole logging techniques: neutron, natural gamma, gamma-gamma, density, induction, caliper, guard resistivity, and single point resistivity (the last two methods only if groundwater is encountered in the bedrock). A down hole video log of the open hole will be made provided the hole remains stable. On the basis of the recovered core and the geophysical logs, a screen interval will be selected and the monitoring well constructed in accordance with SOP GT.6, Monitoring Wells and Piezometer Installation. Well construction will consist of 2-inch nominal diameter, PVC, casing with 0.01-inch slotted screen. Screen length will be determined in the field.

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Field activities will be conducted in accordance with the appropriate Environmental Restoration SOPs. Core samples will be retained in core boxes and logged in accordance with SOP GT.1, Logging in Alluvial and Bedrock Material. Composite soil samples of alluvial materials will be collected in accordance with the procedures specified in TM7 for boreholes at IHSS 133 (EG&G, 1993e). In addition, discrete samples will be collected at 2-foot intervals for VOC analyses. Soil cuttings generated from weathered bedrock will be composite sampled for OU5 target analytes, one per four drums, and managed in accordance with the following SOPs: FO.8, Handling of Drilling Fluids and Cuttings; FO.10, Receiving, Labeling, and Handling Environmental Material Containers; FO.23, Management of Soil and Sediment Investigative Derived Materials (IDM); and F).29, Disposition of Soil and Sediment Investigation Derived Materials. Core samples from the unweathered bedrock will not be collected for environmental chemical analyses, however, if field screening indicates the potential for contaminants, environmental samples will be collected for analysis for OU5 target analytes (Table 3.1.2-1). The boreholes for the bedrock monitoring wells are located outside of IHSS 115 and adjacent to wells drilled in 1993 that indicate no contamination, therefore, the soil cuttings generated

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from the unweathered bedrock will be handled in accordance with SOP FO.23, Management of Soil and Sediment Investigative Derived Materials (IDM), for removel to the landfill.

The three deep bedrock monitoring wells will be developed in accordance with SOP GW.2, Well Development. The bedrock wells will be sampled on a quarterly basis for OU5 target analytes (Table 3.1.2-1) for one year in accordance with GW.6, Groundwater Sampling. If sufficient groundwater is encountered, the deep bedrock monitoring wells may have aquifer tests performed, either slug (GW.4) or pumping (GW.8) tests. Water levels will be collected monthly for one year after development.

Water levels will be measured in all the monitoring wells, well points, and piezometers located along or north of Woman Creek, south of West Road, east of the western Buffer-Zone boundary road, and west of First Street. This includes the piezometers along Woman Creek as discussed in a subsequent paragraph. Water level measurements will continue monthly for a year. This will characterize the magnitude of seasonal fluctuations and provide the hydrogeologic model an average level.

Groundwater samples shall be obtained from any well point or mini-well that is downgradient of the landfill (existing or new) if water level measurements indicate presence of a sufficient quantity of water. These samples will be collected quarterly for at least one year or when sufficient water is present, however, no more than four samples will be collected in one year. Groundwater samples will be collected in the priority listed on Table 3.1.2.3-1. Information from these work elements will be used for the evaluation of nature and extent, as well as input for the hydrogeologic model.

Field QC samples will be collected for both soil and groundwater samples. Duplicate samples will be collected with the frequency of one duplicate sample per 10 real samples. Rinsate samples will be collected with the frequency of one rinsate sample per 20 real samples or a minimum of one rinsate sample per day of sampling. Because groundwater sampling equipment is dedicated, the instrument probes used to measure field parameters will be rinsed to obtain the groundwater rinsate samples.